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(54) Title: MODIFIED ANTIVIRAL PEPTIDES WITH INCREASED ACTIVITY AND CELL MEMBRANE AFFINITY

(57) Abstract: The activity and cell membrane affinity of certain antiviral multiple branch peptide constructions, including those known from WO 95/07929, WO 98/29443 and WO 03/95479, can be improved by bonding to the C-end of the peptide a terminator which is either (a) an ω -amino-fatty acid having from 4 to 10 carbon atoms and from 0 to 2 carbon-carbon double bonds or (b) a peptidic cell membrane penetrating agent. The improvement is so marked that in some cases the number of branches can be reduced, sometimes to a single branch, and/or that the branches may be shortened. The preferred ω-amino-fatty acids are γ-aminobutyric acid, δ-aminovaleric acid and ε-aminocaproic acid. The peptidic cell membrane penetrating agent is suitably a TAT-derived peptide, penetratin® or Kpam.





A. CLASSIFICATION OF SUBJECT MATTER IPC 7 A61K39/21 C07K7/02

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

 $\begin{array}{ll} \text{Minimum documentation searched (classification system followed by classification symbols)} \\ IPC 7 & A61K & C07K \end{array}$

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data

Category °	Citation of document, with indication, where appropriate, of the relevant passages		
	where appropriate, or the relevant passages	Relevant to claim No.	
Υ	WO 95/07929 A (MCKELVEY IAN EDWARD; ARMEL SA (LU)) 23 March 1995 (1995-03-23) cited in the application page 2, paragraph 3 - page 6, paragraph 2	1-3,7-9, 11-14	
Y	WO 98/29443 A (MABROUK KAMEL; ROCHAT HERVE (FR); RIETSCHOTEN JURPHAAS VAN (FR); SABA) 9 July 1998 (1998-07-09) cited in the application page 2, paragraphs 3,4	1,4-8, 10-14	
Y	WO 99/25381 A (UNIV SOUTH CAROLINA) 27 May 1999 (1999-05-27) page 18, line 19 - page 19, line 10	1-13	

X Further documents are listed in the continuation of box C.	χ Patent family members are listed in annex.
 Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier document but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed 	 *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
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orm PCT//SA/210 (second sheet) (January 2004)	Page, M

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International Application No EP2004/005563

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT						
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.				
Р,Ү	WO 03/095479 A (CELLPEP S A) 20 November 2003 (2003-11-20) cited in the application page 1, line 18 - page 3, line 30	1,4-8, 10-14				
A	US 5 876 731 A (CHONG PELE ET AL) 2 March 1999 (1999-03-02) column 6, line 23 - column 7, line 28	1-3,7-9, 11-14				

INTERNATIONAL SEARCH REPORT

information on patent family members

International Application No
FP 2004/005563

P	Patent document		Publication	Γ		1/EP2004/005563	
cite	d in search report		date	ļ	Patent family member(s)		Publication date
WO	9507929	Α	23-03-1995	AP	502	A	07-06-1996
				AT	183201		15-08-1999
				AU	7619694	Α	03-04-1995
				BR	9407530		26-08-1997
				CA	2171531	A1	23-03-1995
				CN	1130911		11-09-1996
				DE	69420042		16-09-1999
				DE	69420042		13-04-2000
				DK	719281		20-03-2000
				ΕP	0719281		03-07-1996
				ES	2137378		16-12-1999
				WO	9507929		23-03-1995
				GR	3031367		31-01-2000
				HU	75092		28-04-1997
				JP		T	28-04-1997
				OA	10271		07-10-1997
				PL	313520		08-07-1996
				US	5622933		22-04-1997
				ZA	9407053		02-05-1995
	0000440						
WO	9829443	Α	09-07-1998	AT	235511		15-04-2003
				ΑU	5764898		31-07-1998
				CA	2274853	A1	09-07-1998
				DE	69720266		30-04-2003
	·			DE	69720266		04-12-2003
				DK	950063	T3	23-06-2003
				WO	9829443		09-07-1998
				ΕP	0950063	A1	20-10-1999
				ES	2195200		01-12-2003
				PT	950063	T	31-07-2003
				US	6379679	B1	30-04-2002
WO	9925381	Α	27-05-1999	AU	746993		20 25 222
				AU	1585399		09-05-2002
				CA	2310462		07-06-1999
				EP	1032422		27-05-1999
				ĴΡ	2001523647	L LT	06-09-2000
				NZ	505161	r Λ	27-11-2001
				WO	9925381		25-07-2003
				US	6582700 E		27-05-1999
					3362700		24-06-2003
	03095479 	A 	20-11-2003	WO	03095479	A1	20-11-2003
US	5876731	Α	02-03-1999	US	5639854 A		17-06-1997
				US	5759769 <i>F</i>	4	02-06-1998
				US	5795955 A		18-08-1998
				US	5817754 A	4	06-10-1998
				US	5800822 A	4	01-09-1998
				US	5951986 A		14-09-1999
				AU	693098 B	32	25-06-1998
				AU	6967394 A		03-01-1995
				BR	9406821 A		26-03-1996
				CA	2164818 A	\1	22-12-1994
				WO	9429339 A	۱1	22-12-1994
				CN	1128538 A		07-08-1996
				EP	0702693 A	1	27-03-1996
				JP	8511007 T	•	19-11-1996
				RU	2201421 C		